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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,359	02/07/2002	Masaki Nitta	01272.020508	7439
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FITZPATRICK CELLA HARPER & SCINTO			NGUYEN, LAM S	
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DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/067,359	Applicant(s) NITTA ET AL.	
	Examiner LAM S. NGUYEN	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15-20, 22 and 25-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-13, 15, 18-20, 22 and 25-30 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/16/2005 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 6-13, 15, 18-20, 22, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koike et al. (US 5767876) in view of Matsubara et al. (US 5633663).

Referring to claims 1, 13, 25-26, and 30:

Koike et al. discloses a color ink-jet recording apparatus using a black recording head (*FIG. 36, element 81*) that ejects black ink on the basis of black image data and a color recording head that ejects color ink on the basis of color image data (*FIG. 36, element 82*), the color ink permeating through a recording medium at a higher speed than the black ink (*column 4, line 57-65: The image is recorded by using low-permeability black ink and high-permeability color ink*), said apparatus comprising:

control means for controlling scanning of the black recording head and of the

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color recording head relative to the recording medium such as to complete a record image in a predetermined recording area including pixels on the recording medium by causing each of the black recording head and the color recording head to perform a plurality of recording scans (*column 4, lines 35-38: The unit pixel is a dot matrix consisting of ink dots in each of which a black ink dot and a color ink dot overlap with each other and blank dots. FIG. 49-51: The area includes the bands A, B, and C, wherein each band includes a plurality of dot matrixes (pixels). FIG. 38-48: The black (K) head and the color (C,M,Y) head perform a plurality of scans in the scanning direction to print an image*);

data generating means, which, for each of the recording heads, generates image data for each of the recording scans corresponding to said predetermined recording area, by using mask pattern, so that black image data corresponding to said predetermined recording area are allotted to each of said recording scans, and color image data corresponding to said predetermined recording area are to each of said recording scans (*FIG. 49-51: In each recording scan, black ink dots are allotted to a corresponding band and each of the color inks is also allotted to each of the bands*),

wherein an allotment rate of the mask pattern for the black image data used in a given one of the recording scans is greater than allotment rate of the mask pattern for the color image data used in that one recording scan, and an allotment rate of the mask pattern for the black image data used in another recording scan is smaller than an allotment rate of the mask pattern for the color image data used in the latter recording scan (*FIG. 40-41: During the 4th recording scan (FIG. 40), while the allotment rate of the mask pattern of the black recording head (K) is 25%, the one of the color recording head is 0%. During the next (5th) recording scan*

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(FIG. 41), while the allotment rate of the mask pattern of the black recording head (K) is 0%, the one of the color recording head is 30%, 25%, and 75% for yellow, magenta, and cyan, respectively).

However, Koike et al. unclearly teaches wherein each of the black recording head and the respective color recording heads perform a plurality of recording scans **in the same pixel**.

Matsubara et al. discloses an ink jet printer having a plurality of recording heads for ejecting ink of different colors on a recording medium by performing plurality of mains scans using a plurality of patterns (*Abstract*) that causes each of the black recording head and the respective color recording heads to perform the plurality of recording scans in the same pixel to form a complete image pixel (*FIG. 28: The complete printed image pixel 3214 is formed by four printing passes, wherein during each pass, black and color heads eject ink in accordance to the mask patterns*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the process for forming image disclosed by Koike et al. to cause each of the black recording head and the respective color recording heads to perform a plurality of recording scans in the same pixel to form image as disclosed by Matsubara et al. The motivation for doing so would have been to obtain high-density image while maintaining the effect of preventing nozzle variations as taught by Matsubara et al. (*column 29, lines 45-49*).

- **Koike et al. also discloses the following claimed invention:**

Referring to claim 2: wherein mask pattern having different allotment rates are used as the mask patterns for said black image data and color image data (*FIG. 38-51*).

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Referring to claims 3, 15: further comprising black image data allotment rate setting means for setting, for each of said recording scans, allotment rates for the mask patterns for said black image data (*FIG. 38-51: a corresponding means for setting the rate of black image data for each scan*); and

color image data allotment rate setting means for setting, for each of said recording scans, allotment rates for the mask patterns for said color image data (*FIG. 38-51: a corresponding means for setting the rate of color image data for each scan*);

wherein both said image data allotment rate setting means set different allotment rates for the mask patterns for said black image data and color image data used during the same recording scan (*FIG. 38-51: the allotment rates of black and colors are different; For example, in FIG. 49, recording scan A, while the allotment rate of Cyan is 50%, the allotment rate of Black is 33%*).

Referring to claims 6, 18: wherein when a black image is to be formed in said predetermined area, before or after the black ink is caused to impact the recording medium, at least one of said plural types of color ink is caused to impact locations onto which the black ink is ejected (*FIG. 40-42, 44-45, 48-51, FIG. 34A_B*)).

Referring to claims 7, 19: further comprising a thinning means, which thins said black image data at a predetermined thinning rate and causes the plural types of color ink to impact portions of the recording area in which said black image data has been thinned (*FIG. 44-45: scan A and FIG. 14A-B*)).

Referring to claims 8, 20: wherein at least one of said plural types of color ink is reactive and tends to cause said black ink to solidify or cohere when contacting with said black ink (*column 21, line 32-41*).

Referring to claims 9, 21: wherein said recording heads executes recording only during scans in one of the forward and backward scanning directions, and in the scanning direction in which the recording is carried out, said color recording heads are arranged in front of said black recording head (*FIG. 46*).

Referring to claims 10, 22: wherein if said recording heads carry out recording in both the forward and backward scanning directions, then during the first recording scan, said color image data has a higher allotment rate than said black image data (*FIG. 49*).

Referring to claims 11, 23: wherein said plural color ink types include cyan, magenta, and yellow ink (*FIG. 36, element 82*).

Referring to claims 12, 24: wherein said recording heads exert thermal energy to generate bubbles in the ink so that energy generated by the bubbles causes the ink to be ejected (*column 1, line 29-32*).

Referring to claims 26-27: a program for executing image processing and a computer-readable storage medium storing the program (*column 18, lines 18-31*).

Referring to claims 28-29: wherein the allotment rate of the mask pattern for said color/black image data used in one recording scan of two recording scans among said plurality of recording scans is different from the allotment rate of the mask pattern for said color/black image data used in the other recording scan of said two recording scans (*FIG. 49-51: In the first scan (FIG. 49), the allotment rates of black, cyan, and magenta inks to print band A are 33%, 50%,*

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and 0%, respectively. In the second scan, the allotment rates of black and cyan inks to print the same band A are both 0%, but the allotment rate of magenta ink is 16%).

Referring to claims 30: wherein the allotment rates of the respective mask patterns for said black and color image data used in one recording scan of two recording scans among said plurality of recording scans are different to each other, and the allotment rates of the respective mask patterns for said black and color image data used in the other recording scan of said two recording scans are different to each other (*FIG. 49-51: In the first scan (FIG. 49), the allotment rates of black and magenta inks to print band A are different to each other (33% and 0%, respectively). In the second scan, the allotment rates of black and magenta inks to print the same band A are also different to each other, while black is 0%, magenta is 16%).*

Allowable Subject Matter

2. Claims 4-5 and 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for allowance were indicated in the previous office action.

Response to Arguments

Applicant's arguments filed 09/16/2005 have been fully considered but they are not persuasive.

The applicant argued that nothing in Matsubara (*the second reference*) would teach or suggest any arrangement or method in which not only is an allotment rate of the mask pattern for black image data used in a recording scan greater than an allotment rate of the mask pattern for the color image data used in that recording scan, but also, an allotment rate of the mask pattern

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for black image data used in an other recording scan is smaller than an allotment rate of the mask pattern for color image data used in the latter recording scan. In response, the examiner cites that the base reference, Koike et al., itself teaches the above claimed limitation. As discussed above, Koike et al.'s FIGs. 40-41 shows that during the 4th recording scan (FIG. 40), the allotment rate of the mask pattern of the black recording head (K) is 25%, that is higher than that of the color recording head, which is 0%; and during the next (5th) recording scan (FIG. 41), the allotment rate of the mask pattern of the black recording head (K) is 0%, which is lower than that of the color recording head which is 30%, 25%, and 75% for yellow, magenta, and cyan, respectively. As a result, Koike et al.'s teaching reads on the language of the above claimed limitation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
11/08/05

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